The Effect of Fertilizer on Seed Production of *Melilotoides ruthenica*

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Introduction

M. ruthenica is very important legume forage, which has drought resistance, winter-hardness and high protein characteristics, and is thus adaptable wide environmental range, but low seed yield limited its widely extension and utilization. Fertilizer is the necessary nutrition for plant growth and production, Alfalfa production positively correlated with soil content of P and K (Attoe and Troug, 1950), and its seed yield can be increased 20.87%～31.37% by splashing B and Mo during the florescence (Haby and Keonaro, 1998). This study discussed the effect of fertilizer of N, P, K and microelements Mo, B, Cu, Zn on the seed production of *M. ruthenica*.

Materials and Methods

The cultivar *Melilotoides ruthenica* (L.) Sojak *cv.* Tumote was breeded by Institute of Grassland Research, CAAS. The fertilizer experiment was conducted in the third year at branching and buding stage after establishment. The plot trial was a randomized complete block design with different treatments and three replicates. The seven treatments were designed with different application of three fertilizers of N, P, K, no fertilizer treatment as control. Nine treatments were designed with different application of Mo, B, Zn, Cu, all the micro-element fertilizers were spraying on the surface of leaf. All plots be harvested at seeds mature stage respectively.

Results and Discussion

A significant increase of seed production in all treatments of N, P, K compared with control (123.97 kg/hm^2) (Fig. 1A). $N_{90}P_{220}K_{60}$ treatment produced higher seeds (156.04kg/hm^2) than $N_{135}P_{330}K_{90}$ (144.45 kg/hm^2) and $N_{45}P_{110}K_{30}$ (139.96 kg/hm^2). The seed production of all micro-elements treatments were higher than control too (Fig. 1B), Mo and Zn had similar effect (129.92 kg/hm^2 and 129.58 kg/hm^2, respectively), which is better than B (125.09kg/hm^2) and Cu (125.82 kg/hm^2).

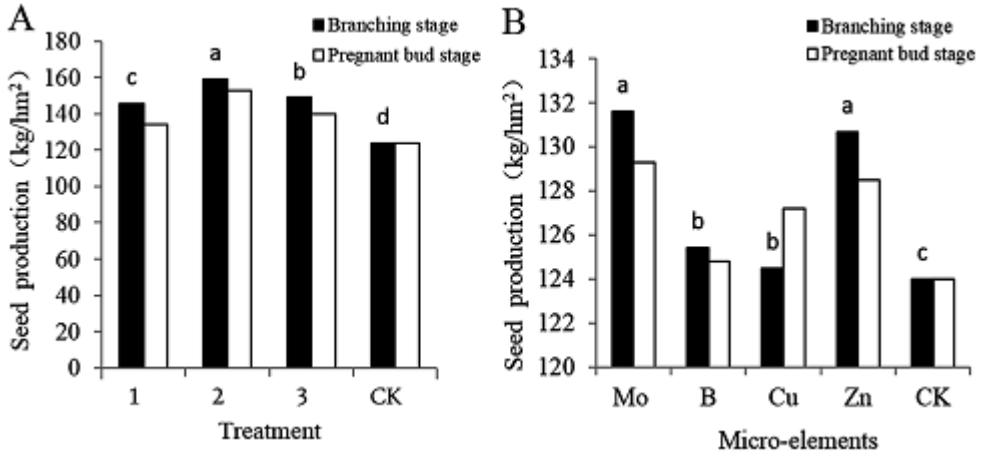

Fig 1 A Effect of N, P, K fertilizer on seed production of *M. ruthenica*
Note:1 $N_{45}P_{110}K_{30}$;2 $N_{90}P_{220}K_{60}$;3 $N_{135}P_{330}K_{90}$.
B Effect of Mo, B, Cu, Zn fertilizer on seed production of *M. ruthenica*

Conclusion

Using fertilizer can increase seed production of the new variety of *M. ruthenica* (L.) Sojak cv. Tumote effectively, the optimal N, P, K fertilizer combination is N 90 kg ha^{-1}, P_2O_5 220 kg ha^{-1}, K_2O 60 kg ha^{-1}, which increased the seed production by 25.87%. Micro-elements Mo and Zn increased the seed production by 4.8% and 4.5%, respectively.

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